

IN THE CLAIMS:

1-15. (Cancelled)

16. (Amended) A method of forming a transparent multi-layer coating over a substrate comprising:

forming an organo-silicon polymer surface-hardening layer over said substrate;

forming a multi-layer abrasion-resistant coating over said organo-silicone polymer surface-hardening layer by sequentially depositing a plurality of alternating layers of silicon dioxide and zirconium dioxide of respectively different thicknesses over said organo-silicone polymer surface-hardening layer using a dry coating technique; and

depositing a transparent perfluorinated hydrophobic coating over said abrasion-resistant coating using a dry coating technique.

17. (Amended) The method of claim 16, wherein said abrasion-resistant coating and said transparent perfluorinated hydrophobic coating are dry coatings which are formed by a vacuum deposition technique.

18. (Original) The method of claim 16, wherein said abrasion-resistant coating is formed to sequentially comprise a silicon dioxide layer, a zirconium dioxide layer, a silicon dioxide layer, a zirconium dioxide layer, and a silicon dioxide layer.

19. (Original) The method of claim 18, wherein said abrasion-resistant coating is formed to sequentially comprise a silicon dioxide layer of approximately 907 angstrom, a zirconium dioxide layer of approximately 765 angstrom, a silicon dioxide layer of approximately

4 174 angstrom, a zirconium dioxide layer of approximately 246 angstrom, and a silicon dioxide
5 layer of approximately 2616 angstrom.

1 20. (Amended) The method of claim 16, wherein said transparent perfluorinated
2 hydrophobic coating comprises perfluoroalkylsilane.

1 21. (Original) The method of claim 20, wherein said perfluoroalkylsilane coating is
2 formed to have a thickness of approximately 5-20 nm.

1 22. (Amended) The method of claim 16, wherein said transparent perfluorinated
2 hydrophobic coating and said abrasion-resistant coating have substantially equal thermal
3 coefficients of expansion.

1 23. (Cancelled)

1 24. (Amended) The method of claim ~~23~~ 16, wherein organo-silicon polymer material
2 is triethoxymethyl silane.

1 25. (Amended) The method of claim ~~23~~ 16, wherein said organo-silicon layer is
2 formed to have a thickness of approximately 2-3 microns.

1 26. (Previously Presented) The method of claim 16, wherein said coating is formed
2 on a glass substrate.

1 27. (Previously Presented) The method of claim 16, wherein said coating is formed
2 on a polymer-based substrate.

1 28-29. (Cancelled)

1 30. (Amended) A method of forming a transparent multi-layer coating over a
2 transparent plastic substrate to provide abrasion-resistant and hydrophobic properties comprising
3 the steps of;

4 providing a transparent plastic substrate;

5 forming an organo-silicon tie-bond layer on the plastic substrate;

6 forming a multi-layer abrasion-resistant coating of alternating layers of silicon
7 dioxide and zirconium dioxide over the tie-layer wherein a thickness of a first layer adjacent the
8 tie-layer is larger than each respective subsequent layer; and

9 depositing a transparent perfluorinated hydrophobic coating over the abrasion-
10 resistant coating with a dry coating technique wherein the thicknesses of each layer and
11 corresponding thermal coefficients of expansion cooperate to match a thermal coefficient of
12 expansion of the plastic substrate over an operative predetermined thermal range.

1 31. (Amended) The method of claim 30 wherein the transparent perfluorinated
2 hydrophobic coating is perfluoroalkylsilane.

1 32. (Previously Presented) The method of claim 31 wherein the tie-bond layer is a
2 triethoxymethyl silane.

1 33. (Previously Presented) The method of claim 30 wherein the thickness of each
2 alternating layer of the abrasion-resistant coating is different.

1 34. (Previously Presented) The method of claim 33 wherein the sum of the combined
2 thicknesses of the silicon dioxide layers are at least three times greater than the sum of the
3 combined thicknesses of the zirconium dioxide layers.

1 35. (Previously Presented) The method of claim 30 wherein a thickness of an outside
2 layer of the abrasion-resistant coating is larger than any intermediate layer after the first layer.

1 36. (Previously Presented) A method of forming a transparent multi-layer coating
2 over a transparent plastic substrate to provide abrasion-resistant and hydrophobic properties
3 comprising the steps of:

4 providing a transparent plastic substrate from one of polycarbonate and acrylic;
5 forming an organo-silicon tie-bond layer on the plastic substrate;
6 forming a multi-layer abrasion-resistant coating of alternating layers of silicon
7 dioxide and zirconium dioxide over the tie-bond layer wherein a thickness of a first layer
8 adjacent the tie-bond layer is larger than each respective subsequent layer; and
9 depositing a perfluoroalkylsilane coating over the multi-layer abrasion-resistant
10 coating of sufficient thickness to make the plastic substrate hydrophobic, wherein the thicknesses
11 of each layer and corresponding thermal coefficients of expansion cooperate to match a thermal
12 coefficient of expansion of the plastic substrate over an operative predetermined thermal range.

1 37. (Previously Presented) The method of claim 36 wherein the tie-bond layer is
2 triethoxymethyl silane.

1 38. (Previously Presented) The method of claim 37 wherein the thickness of each
2 alternating layer of the abrasion-resistant coating is different.

1 39. (Previously Presented) The method of claim 38 wherein the sum of the combined
2 thicknesses of the silicon dioxide layers is at least three times greater than the sum of the
3 combined thickness of the zirconium dioxide layers.

1 40. (Previously Presented) The method of claim 39 where a thickness of an outside
2 layer of the abrasion-resistant coating is larger than any intermediate layer after the first layer.